भारतीय मानक
Indian Standard

IS 12031 : 2022

साबुन स्टॉक — विशिष्टि

(पहला पुनरीक्षण)

Soap Stock — Specification

(First Revision)

ICS 71.100.40

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.in www.standardsbis.in

November 2022 **Price Group 5**

Soaps and Other Surface Active Agents Sectional Committee, CHD 25

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Soaps and Other Surface Active Agents Sectional Committee had been approved by the Chemical Division Council.

Soap stock is produced during the refining of oils by alkali. The free fatty acids present in the starting oils get converted into soap which is soluble in water, but soluble to a very limited extent in the oil. The aqueous soap layer is separated by gravity or centrifuge. It contains three major components: (a) soap produced by reaction with fatty acid, (b) some emulsified neutral oil, and (c) water containing electrolytes like sodium chloride which are often added to reduce viscosity and emulsion formation. Depending on the method of refining, the soap stock will have different levels of moisture.

Soap stock, because of its expensive fatty matter content, cannot be wasted and is utilised for soap making. Because of the impurities removed from the oil during refining, the soap stock fatty matter is usually inferior to the starting oil. Being an aqueous medium with heavy organic loading, it is subjected to microbial action and degradation, which further degrades the quality of fatty matter contained therein. Both from the point of view of transportation and to ensure stability, it is necessary to remove the extra water as early as possible. This is achieved by converting it into acid oil.

This standard was originally published in 1986. This revision has been taken up in order to bring out the standard in latest style and format of the Indian Standards. The relevant clauses have been added and the references have been updated. Also in this revision, a requirement for maximum phosphorus limit content is added and a test method for the determination of phosphorus content is also added.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

SOAP STOCK — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for soap stock.

2 REFERENCES

The Indian standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Indian standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No	*Title*
286 : 2018	Methods of sampling and test for soaps (*third revision*)
548 (Part 1/Sec 1) : 2021	Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests, Section 1 Sampling
548 (Part 1/Sec 2) : 2021	Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests, Section 2 Physical and chemical tests
548 (Part 3/Sec 6) : 2021/ISO 10540-1 : 2003	Methods of sampling and test for oils and fats: Part 3 Advanced instrumental methods, Section 6 Determination of phosphorus content by colorimetric method
1070 : 1992	Reagent grade water-Specification (*third revision*)
2711 : 1979	Specification for direct reading *p*H meter (*second revision*)
11476 : 1985	Glossary of terms relating to oils and fats

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 11476 shall apply.

4 REQUIREMENTS

4.1 Description

The material shall be an aqueous medium with heavy organic loading.

4.2 The material shall also conform to the requirements given in Table 1, when tested according to methods prescribed in co1 (4) of Table 1.

Table 1 Requirements for Soap Stock
(*Clause* 4.2)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Total fatty matter (TFM), percent by mass, *Min*	20	IS 286
ii)	*p*H of 1 percent solution, *Min*	7.0	**A-2** of Annex A
iii)	Unsaponifiable matter, percent by mass on TFM, *Max*	5.0	IS 548 (Part 1/Sec 2)
iv)	Oxidized fatty acid, percent by mass on TFM, *Max*	5.0	**A-3** of Annex A
v)	Phosphorus content, ppm, *Max*	150	IS 548 (Part 3/Sec 6)

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in suitable containers or transported through tankers or as agreed to between the purchaser and the supplier.

5.2 Marking

5.2.1 The material, if packed in containers, shall be securely closed and marked with the following information:

a) Name of the material;
b) Manufacturer's name and recognized trade-mark, if any;
c) Net mass of the material;
d) Batch number or lot number in code or otherwise; and
e) Month and year of manufacture.

5.2.2 The containers shall also, in addition, be legibly and indelibly marked with the information required under the Standards of Weights and Measures (Package Commodities) Rules, 1977.

5.2.3 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark

6 SAMPLING

Representative samples of the material shall be drawn as prescribed in IS 548 (Part 1/Sec 1).

ANNEX A
[Table 1, *Sl No.* ii) and iv)]

METHODS OF TEST FOR SOAP STOCK

A-l QUALITY OF REAGENTS

Unless stated otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2 DETERMINATION OF *p*H

A-2.1 General

The *p*H determination should be made in an acid free atmosphere.

A-2.2 Apparatus

A-2.2.1 *pH Meter*

Any standard electro-metric instrument, equipped with a low sodium error glass electrode. The instrument shall be calibrated and standardized with standard buffer solutions (*see* **A-2.3.2**) before use (*see* IS 2711).

A-2.2.2 *Volumetric Flask — 1 000 ml Capacity*

A-2.2.3 *Beaker — l00 ml Capacity*

A-2.3 Reagents

A-2.3.1 *Distilled Water*

Distilled water shall be boiled thoroughly or purged with carbon dioxide-free air to remove carbon dioxide, and shall be protected with soda lime or soda asbestos while cooling and in storage. The *p*H of this water shall be between 6.2 and 7.2 at 27 °C. The residue on evaporation when heated at 105 °C for one hour shall not exceed 0.5 mg per litre.

A-2.3.2 *Standard Buffer Solution*

Any two suitable buffer solutions within the *p*H range of 9 to 11 at 27 °C for calibrating the *p*H meter.

A-2.4 Procedure

A-2.4.1 Weigh 10 g ± 0.001 g of the material and transfer to a 1 litre volumetric flask. Partially fill the flask with distilled water and agitate until the sample is completely dissolved. Adjust the temperature of the solution and the distilled water to 27 °C ± 0.5 °C, and fill to the calibration mark with the distilled water. Stopper the flask, mix thoroughly, and allow the solution to stand at a temperature of 27 °C for 2 hours prior to measuring the *p*H. Measure the *p*H of the solution using a glass electrode.

A-3 DETERMINATION OF OXIDIZED FATTY ACID

A-3.0 General

A known quantity of the material is saponified with alcoholic potash and the soap formed is treated with mineral acid to release the fatty acids. The petroleum ether insoluble but ethyl ether soluble matter, which is termed as oxidized fatty acid, is determined by evaporation of the ethyl extract of the residual aqueous layer left behind after the petroleum ether extraction.

A-3.1 Apparatus

A-3.1.1 *Stoppered Glass Cylinder — 250 ml Capacity.*

A-3.1.2 *Separating Funnel — 500 ml Capacity.*

A-3.1.3 *Flasks — 250 ml Capacity, Flat Bottom; and 300 ml Capacity, Conical.*

A-3.2 Reagents

A-3.2.1 *Alcoholic Potassium Hydroxide Solution*

Dissolve 50 g of potassium hydroxide in 1 litre of 95 percent ethyl alcohol.

A-3.2.2 *Dilute Hydrochloric Acid — 1:1 By Volume.*

A-3.2.3 *Methyl Orange Indicator*

Dissolve 0.1 g of methyl orange indicator in 100 ml of water.

A-3.2.4 *Petroleum Ether — 60 °C/80 °C Distillation Range.*

A-3.2.5 *Ethyl Ether*

A-3.3 Procedure

A-3.3.1 Weigh accurately 3 g to 5 g of the fatty matter into a 300 ml conical flask. Add 50 ml of alcoholic potash, cover with an inverted funnel and heat on a water-bath to saponify. Agitate frequently and heat for at least 30 minutes or until saponification is complete.

A-3.3.2 Remove the watch-glass and continue heating on a water-bath with occasional agitation to evaporate the alcohol. To avoid oxidation, do not evaporate beyond a pasty mass. If necessary, add a small amount of water when most of the alcohol has evaporated.

A-3.3.3 Add 100 ml of distilled water and heat until the soap has completely dissolved. Wash the contents into a glass-stoppered cylinder with hot distilled water, taking care not to exceed a total volume of 130 ml in the cylinder.

A-3.3.4 Add 3 drops to 5 drops of indicator and neutralize with hydrochloric acid to the pink methyl orange end point. Then add 1 ml of excess acid. Rotate the cylinder gently to mix the contents.

A-3.3.5 Cool to at least 35 °C and add 125 ml of petroleum ether. The fatty acids need not have cleared completely before adding the ether. Stopper the cylinder, shake gently, and allow to stand until the petroleum ether layer separates.

A-3.3.6 Siphon the petroleum ether layer into a 500 ml separating funnel, making sure that as little as possible of the insoluble matter which gathers at the ether-water interface is carried over into the separating funnel. If any appreciable amount of insoluble matter does siphon over into the separating funnel, it will usually settle to the bottom and shall be drained back into the extraction cylinder. Make at least 4 more similar extractions using 25 ml to 30 ml of petroleum ether, shaking the cylinder vigorously for 30 seconds with each extraction. Extractions shall be continued until the petroleum ether layer is practically colourless.

A-3.3.7 To the acid water remaining in the extraction cylinder add 25 ml to 30 ml of ethyl ether, stopper, shake gently and allow to stand until the ether layer separates. Siphon the ethyl ether layer through a filter paper into a tared 250 ml flat bottom flask which has been dried and cooled in a desiccator. Make at least 4 more similar extractions using 25 ml to 30 ml of ethyl ether each time, and shake the cylinder vigorously for 30 seconds with each extraction. The last ethyl ether extract shall be practically colourless.

A-3.3.8 Filter all extracts through the same filter paper and finally wash this filter paper thoroughly with ethyl ether to recover all the oxidized acids.

A-3.3.9 Evaporate the ethyl ether extracts on a water-bath under a gentle stream of clean dry air. Finally, dry the oxidized fatty acids in an air oven at 105 °C ± 2 °C for 30 minutes. Cool in a desiccator to room temperature and weigh. Repeat until constant mass, that is, to within 0.1 percent between successive weighings, is obtained.

A-3.4 Reporting

Report the oxidized fatty acids as a percentage of the material taken for the test.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Soaps and Other Surface Active Agents Sectional Committee, CHD 25

Organization	*Representative(s)*
Harcourt Butler Technological University, Kanpur	PROF RAKESH K. TRIVEDI (***Chairperson***)
Central Drugs Standard Control Organization, New Delhi	SHRI SUDIPTA DEY
Central Pollution Control Board, New Delhi	SHRI DINABANDHU GOUDA SHRI A. SUDHAKAR
Consumer Guidance Society of India, Mumbai	DR SITARAM DIXIT SHRI B. V. DESAI
Consumer Voice, New Delhi	SHRI M. A. U. KHAN SHRI B. K. MUKHOPADHAYA
Dabur India Limited, Sahibabad	SHRI AMIT SIRDESAI SHRI RAVI TRIPATHI
Directorate General Quality Assurance, Ministry of Defence, Kanpur	SHRI A. K. PATRA DR S. K. PANDEY
FASSSDMI, Delhi	SHRI ASEEM GALHOTRA SHRI ASHOK KUMAR
Fena Private Limited, New Delhi	SHRI DALIP JOLLY SHRI BENNY G. JACOB
Godrej Consumers Products Limited, Mumbai	DR MANOJ GAUR SHRI VENKATESWARA YADLAPALLI SHRIMATI RUPINDER KAUR RAWAT
Harcourt Butler Technical University, Kanpur	DR P. K. S. YADAV DR VINAYA TIWARI
Hindustan Unilever Limited, Mumbai	DR A. SIVAKUMAR SHRIMATI VRINDA RAJWADE
ITC Limited, Kolkata	DR DOSS JAYAPRAKASH
Indian Home & Personal Care Industries Association, Mumbai	SHRI SANJAY N. TRIVEDI SHRI ANOOP MISHRA
Indian Oil Corporation Limited, Mumbai	SHRI S. P. SELVAM SHRI RISHIKESH PRAJAPATI SHRI ALOK SRIVASTAVA
Institute of Chemical Technology, Mumbai	DR AMIT P. PRATAP PROF R. D. KULKARNI
Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, New Delhi	SHRI NAND LAL SHRI N. C. TIWARI

Ministry of Micro Small & Medium Enterprises (MSME), New Delhi	SHRI MANOJ KUMAR SHRI VIPUL GAIKWAD
National Institute of Technology, Arunachal Pradesh National Test House, Ghaziabad	DR KARTICK MONDAL SHRI AVINASH KUMAR
Novozyme South Asia Private Limited, Mumbai	DR MADHURIMA MISHRA DR VASUDHEVA REDDY SHRI NARESH RAGHAVAN
Oil Technologist Association of India, Kanpur	SHRI ASHOK MAHINDRU PROF (DR) G. A. USMANI
Procter & Gamble India, Mumbai	SHRI GIRISH PARHATE SHRI SIVAKUMAR THANIGACHALAM
Reckitt Benckiser India Limited, Mumbai	SHRI RUCHIR SHAH SHRIMATI JASMIN KALRA
BIS Directorate General	SHRI A. K. LAL, SCIENTIST 'F' AND HEAD (CHD) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretary
PUJA PRIYA
SCIENTIST 'C' (CHD), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.

This Indian Standard has been developed from Doc No.:CHD 25 (19052).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi